

Hawaii Hydrogen Center for Development and Deployment of Distributed Energy Systems

04 DOE Hydrogen, Fuel Cells & Infrastructure Technologies Program Review

**Richard Rocheleau
Hawaii Natural Energy Institute
School of Ocean and Earth Science and Technology
University of Hawaii at Manoa
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**This presentation does not contain any proprietary or
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Objectives

- **Develop an integrated program for the development and deployment of hydrogen based distributed energy systems**
- **Advance key technologies, consistent with DOE plan, to advance hydrogen production technologies and infrastructure research and testing**



Budget

\$ 3 million appropriated in the FY04 Omnibus Bill



Technical Barriers and Targets

Negotiations currently ongoing with DOE to identify appropriate projects

Key technical targets associated with individual projects to be presented in poster at 04 DOE program review



Approach

Select projects where Hawaii expertise or Hawaii energy situation offers unique opportunities

Build upon other existing hydrogen and fuel cell projects in Hawaii which are funded by DOE, DOD and private sector to leverage resources

Establish collaborations with NREL, other DOE laboratories, and international organizations



Project Timeline

FY04 funds

- May 04 – submission of proposal**
- August 04 – initiate programs**
- September 05 – complete activities**

FY05

- Funding unknown**



Technical Accomplishments/Progress

Proposed activities to include

- **Renewable Hydrogen Production**
 - **Research on renewable H₂ technologies in support of Power Park**
 - **Geothermal hydrogen**
 - **Direct wind electrolysis – interconnect technology**
 - **Biomass to hydrogen via gaseous and liquid precursors**
 - **Development of reforming technology for bioderived fuels**
 - **Development of infrastructure and electronic materials for photoelectrochemical hydrogen production**
 - **Biohydrogen production**
- **Fuel cell testing to characterize hydrogen fuel purity needs**
- **Development of national and international partnerships**



Interactions and Collaborations

- **All projects selected will involve interactions and collaborations. Potential collaborators include**
 - **Hawaiian electric and gas utility companies**
 - **Hawaii sugar companies for biomass to hydrogen efforts**
 - **DOE laboratories**
 - **Pacific International Center for High Technology Research**
 - **Sentech, Inc**
 - **City and County of Honolulu**
 - **Natural Energy Laboratory Hawaii (NELHA)**



Responses to Reviewer's Comments

- **This is a new project so there was no review in 2003**



Future Work

- **Seek funding from federal, state and private sources to continue activities showing promise to meet DOE goals**
- **Testing in support of fuel cell development activities**
- **Development of biohydrogen production center**



Project Safety

- **During development of the “Hawaii Fuel Cell Test Facility” under DOD funding, UH developed extensive hydrogen safety plans. Elements included:**
 - Database of relevant codes and standards
 - Failure modes and effects analysis (FMEA)
 - Review by industrial partner of FMEA and safety compliance
 - Generation of in-house safety manuals
 - Regular review of safety issues and training.
- **UH will use this model to develop a full safety plan for each of the projects conducted under this funding. Each will incorporate the elements above**

